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"AS-BUILT" DESIGN SPECIFICATION
FOR THE
BRAZIL AND CHINA MONTHLY DATA BASES

Job Order 74-963

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FOR THE BRAZIL AND CHINA MONTHLY DATA BASES
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National Aeronautics and Space Administration
LYNDON B. JOHNSON SPACE CENTER

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May 1977



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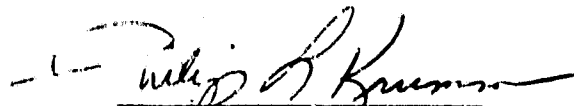
"AS-BUILT" DESIGN SPECIFICATION
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CONTENTS

Section	Page
1. SCOPE	1-1
2. APPLICABLE DOCUMENTS	2-1
3. SYSTEM DESCRIPTION	3-1
3.1 <u>HARDWARE DESCRIPTION</u>	3-1
3.2 <u>DATA BASE STRUCTURE</u>	3-1
3.2.1 DATA BASE STORAGE REQUIREMENTS	3-1
3.2.2 CONTROL AND DIRECTORY BLOCKS	3-1
3.2.3 DATA DESCRIPTORS AND DATA BLOCKS	3-1
3.2.4 MODEL DEFINITION BLOCK	3-2
4. OPERATION	4-1
4.1 <u>DATA BASE INITIALIZATION AND DEFINITION</u>	4-1
4.2 <u>DATA CONVERSION (BRAZIL ONLY)</u>	4-1
4.3 <u>DATA BASE LOADING</u>	4-1
4.4 <u>DATA BASE LISTING</u>	4-1

APPENDIX

A. LISTING OF CONTROL BLOCK AND DIRECTORIES	A-1
B. DESCRIPTOR STRUCTURES	B-1
C. VARIABLE CODES	C-1
D. CONVERSION PROGRAM LISTING AND FLOWCHART	D-1

1. SCOPE

This document specifies design of the monthly weather and yield data bases for Brazil and China, following the same design as those previously documented for Australia, Canada, the U.S., and the U.S.S.R. in the "As-Built Design Specification for the Yield Estimation Subsystem (YES) Monthly Yield Data Base and Supporting Programs" (JSC-12537/LEC-10034).

2. APPLICABLE DOCUMENTS

- o Action Documentation 63-1347-4963-10
- o "As-Built" Design Specification for the Yield Estimation Subsystem (YES) Monthly Data Base and Supporting Programs" (JSC-12537/LEC-10034).

3. SYSTEM DESCRIPTION

3.1 HARDWARE DESCRIPTION

These data, and supporting programs previously documented in "As-Built Design Specification" (JSC-12537/LEC-10034), are resident on the IBM 360/195 complex at Suitland, Maryland. They should be transferable to any IBM 360-370 series machine with sufficient disk to handle the data base and main memory to support the PL/I optimizing compiler.

3.2 DATA BASE STRUCTURE

The monthly weather and yield data base is a tree structure, with nodes, or levels, being the country, region, zone, strata and station. For the Brazil data base, only the first three levels are present; these represent Brazil, southern Brazil, and Brazilian states, respectively. The five level representations in the China data base are, respectively, China, major geographic regions, Chinese provinces, Chinese provinces (repeated, as no LACIE strata divisions of China exist at this time), and WMO stations.

3.2.1 DATA BASE STORAGE REQUIREMENTS

The data sets for Brazil and China were input to space reserved for the India data base, as all three data sets are relatively small and could easily fit into the 114 6440-byte blocks originally allocated to India.

3.2.2 CONTROL AND DIRECTORY BLOCKS

The format for the control and directory blocks follows that previously defined in "As-Built Design Specification." The control block for file INDIA was updated to include both Brazil and China, and directory blocks for both countries were added to file INDIA.

Listings of the control block and the directory blocks are found in Appendix A.

3.2.3 DATA DESCRIPTORS AND DATA BLOCKS

The format for the data descriptors and data blocks follows that previously defined in "As-Built Design Specification."

Both weather and yield variables are stored at the zone level in both countries (Brazilian states and Chinese provinces). Only weather variables are stored for the Chinese WMO stations.

Descriptor structures are found in Appendix B. A listing of variable codes contained in the descriptors is found in Appendix C.

3.2.4 MODEL DEFINITION BLOCK

Structure is provided to allow inclusion of model definitions.

4. OPERATION

4.1 DATA BASE INITIALIZATION AND DEFINITION

As the Brazil and China data bases were added to empty, previously initialized blocks of file INDIA, no further initialization was necessary. Control block update, and directory and descriptor definitions were accomplished using YESM001 and supporting subroutines from "As-Built Design Specification" (JSC-12537/LEC-10034).

4.2 DATA CONVERSION (BRAZIL ONLY)

Data for Brazil located at CCEA in Columbia, Missouri, exist in formats different from that required for inclusion in the data base. A short PL/I program was written to handle the conversions to the required format.

Converted data were stored on a catalogued disk file, and transferred to file INDIA when all conversions were completed.

The program listing and flowchart appear in Appendix D.

4.3 DATA BASE LOADING

Data for Brazil and China were loaded using the updating program UPDDATA, documented in "As-Built Design Specification."

4.4 DATA BASE LISTING

Listing of the control and directory blocks are accomplished using, respectively, YESLS02 and YESLS04, documented in "As-Built Design Specification." To list data, LISTJOB, also from "As-Built Design Specification," will have to be modified to accomodate data for Brazil and China.

APPENDIX A
LISTING OF CONTROL BLOCK
AND DIRECTORIES

LIST CONTROL BLOCK PROGRAM

THE FILE IDENTIFICATION NAME IS INDIA

THE PASSWORD(S) ARE WILLIAMSSLFMONS

THE LEVEL NAMES ARE COUNTRY
STATION

REGION

ZONE

SUBDIVISION

THE FOLLOWING CODE NUMBERS ARE USED FOR DATA IN THE FILE

CODE#	UNIT#	CODE NAME	UNIT NAME	BASE	SCALE
5	201	PRECIPITATION	MILLIMETERS	2	0
35	241	MEAN TEMPERATURE	DEGREES CENTIGRADE	2	-1
71	171	IRRIGATED WHEAT AREA	PERCENT ALL WHEAT AREA	2	-3
101	236	HARVESTED WHEAT AREA	HECTARES	4	0
103	228	PRODUCTION	QUINTALS	3	0
202	0	WINTER WHEAT		3	12
206	0	MONTHLY		2	7
61	0	YEAR		2	0
90	0	POINTER		2	0
91	0	RECORD POINTER		2	0
92	0	DISPLACEMENT POINTER		2	0
99	0	FILLER		2	0

THE FOLLOWING COUNTRIES ARE INCLUDED IN THE FILE

CODE#	COUNTRY	NUMBER OF DIRECTORIES	LOCATION OF FIRST DIRECTORY
4	INDIA	47	1
1	BRAZIL	7	47
7	PEOPLE'S REP OF CHINA	41	48

THE FILE HAS BEEN DEFINED TO CONTAIN 113 RECORDS. EACH 6440 BYTES LONG

RECORD NUMBER ZERO CONTAINS THE CONTROL BLOCK FOR THE FILE

KEY TO RECORD TYPE CODES: CODE# RECORD TYPE

0	BLANK/UNUSED
-1	DIRECTORY BLOCK
+1	DATA DESCRIPTOR AND DATA BLOCK
+2	MODEL DEFINITION BLOCK

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WFOURD	TYPE	FREESPACE (IN BYTES)	LOCATION OF FREESPACE	LOCATION OF FREESPACE	TYPE	FREESPACE (IN BYTES)	LOCATION OF FREESPACE	WFOURD
1	1	104	6337	6337	1	104	6337	1
5	1	104	6337	6337	1	104	6337	5
7	1	104	6337	6337	1	104	6337	7
11	1	104	6337	6337	1	104	6337	11
15	1	104	6337	6337	1	104	6337	15
19	1	104	6337	6337	1	104	6337	19
23	1	104	6337	6337	1	104	6337	23
27	1	104	6337	6337	1	104	6337	27
31	1	104	6337	6337	1	104	6337	31
35	1	104	6337	6337	1	104	6337	35
39	1	104	6337	6337	1	104	6337	39
43	1	104	6337	6337	1	104	6337	43
47	1	104	6337	6337	1	104	6337	47
51	1	104	6337	6337	1	104	6337	51
55	1	104	6337	6337	1	104	6337	55
59	1	104	6337	6337	1	104	6337	59
63	1	104	6337	6337	1	104	6337	63
67	1	104	6337	6337	1	104	6337	67
71	1	104	6337	6337	1	104	6337	71
75	1	104	6337	6337	1	104	6337	75
79	1	104	6337	6337	1	104	6337	79
83	1	104	6337	6337	1	104	6337	83
87	1	104	6337	6337	1	104	6337	87
91	1	104	6337	6337	1	104	6337	91
95	1	104	6337	6337	1	104	6337	95
99	1	104	6337	6337	1	104	6337	99
103	1	104	6337	6337	1	104	6337	103
107	1	104	6337	6337	1	104	6337	107
111	1	104	6337	6337	1	104	6337	111
113	1	104	6337	6337	1	104	6337	113

THE UNIVERSITY OF MICHIGAN

THE UNIVERSITY OF CHICAGO

LEVEL CODE	1	2	3	4	5
1					
2					
3					
4					
5					

NA-4E
BRAZIL
SOUTHERN BRAZIL
MATO GROSSO
SAO PAULO
PARANA
SANTA CATARINA
RIO GRANDE DO SUL

1. ATTY. GEN. - 10.00
- 22.00
- 14.44
- 21.44
- 24.44
- 27.44
- 22.00

LOGITUDE	DATE	TIME
51.9	1	1
53.5	47	77
56.0	47	77
48.0	47	77
51.5	47	77
51.8	47	77
52.9	47	77

CHILD	47	77
1	47	77
2	47	77
3	47	77
4	47	77
5	47	77
6	47	77
7	47	77
8	47	77
9	47	77
10	47	77
11	47	77
12	47	77
13	47	77
14	47	77
15	47	77
16	47	77
17	47	77
18	47	77
19	47	77
20	47	77
21	47	77
22	47	77
23	47	77
24	47	77
25	47	77
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27	47	77
28	47	77
29	47	77
30	47	77
31	47	77
32	47	77
33	47	77
34	47	77
35	47	77
36	47	77
37	47	77
38	47	77
39	47	77
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41	47	77
42	47	77
43	47	77
44	47	77
45	47	77
46	47	77
47	47	77
48	47	77
49	47	77
50	47	77
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53	47	77
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83	47	77
84	47	77
85	47	77
86	47	77
87	47	77
88	47	77
89	47	77
90	47	77
91	47	77
92	47	77
93	47	77
94	47	77
95	47	77
96	47	77
97	47	77
98	47	77
99	47	77
100	47	77

[illegible]

100

100

MODELS
-1-1-1-1-1-1-

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LEVEL	CONF	NAME	LATITUDE	LONGITUDE	POPULATION	MOBILE	CHILD	DATA	MODELS
1	7	PEOPLE'S REP OF CHINA	35.0	-107.0	-1	1	77	-1	
2	7	SOUTHERN CHINA	33.5	-112.5	-1	1	44	49	
3	4	HEILONGJIANG	47.0	-126.0	44	44	153	50	
4	5	JIANGSU	32.0	-119.5	44	44	341	50	
5	5	HUBEI (HUBEI)	32.7	-113.5	44	44	457	50	
6	5	HUNAN	28.0	-113.5	44	44	1	50	
7	10	BEIJING-MONGOLIA A.S.	40.0	-116.0	44	44	1	50	
8	13	JIANGSU	32.0	-113.5	44	44	1	50	
9	13	JIANGSU	32.0	-113.5	44	44	1	50	
10	13	JIANGSU	32.0	-113.5	44	44	1	50	
11	13	JIANGSU	32.0	-113.5	44	44	1	50	
12	13	JIANGSU	32.0	-113.5	44	44	1	50	
13	13	JIANGSU	32.0	-113.5	44	44	1	50	
14	13	JIANGSU	32.0	-113.5	44	44	1	50	
15	13	JIANGSU	32.0	-113.5	44	44	1	50	
16	13	JIANGSU	32.0	-113.5	44	44	1	50	
17	13	JIANGSU	32.0	-113.5	44	44	1	50	
18	13	JIANGSU	32.0	-113.5	44	44	1	50	
19	13	JIANGSU	32.0	-113.5	44	44	1	50	
20	13	JIANGSU	32.0	-113.5	44	44	1	50	
21	13	JIANGSU	32.0	-113.5	44	44	1	50	
22	13	JIANGSU	32.0	-113.5	44	44	1	50	
23	13	JIANGSU	32.0	-113.5	44	44	1	50	
24	13	JIANGSU	32.0	-113.5	44	44	1	50	
25	13	JIANGSU	32.0	-113.5	44	44	1	50	
26	13	JIANGSU	32.0	-113.5	44	44	1	50	
27	13	JIANGSU	32.0	-113.5	44	44	1	50	
28	13	JIANGSU	32.0	-113.5	44	44	1	50	
29	13	JIANGSU	32.0	-113.5	44	44	1	50	
30	13	JIANGSU	32.0	-113.5	44	44	1	50	
31	13	JIANGSU	32.0	-113.5	44	44	1	50	
32	13	JIANGSU	32.0	-113.5	44	44	1	50	
33	13	JIANGSU	32.0	-113.5	44	44	1	50	
34	13	JIANGSU	32.0	-113.5	44	44	1	50	
35	13	JIANGSU	32.0	-113.5	44	44	1	50	
36	13	JIANGSU	32.0	-113.5	44	44	1	50	
37	13	JIANGSU	32.0	-113.5	44	44	1	50	
38	13	JIANGSU	32.0	-113.5	44	44	1	50	
39	13	JIANGSU	32.0	-113.5	44	44	1	50	
40	13	JIANGSU	32.0	-113.5	44	44	1	50	
41	13	JIANGSU	32.0	-113.5	44	44	1	50	
42	13	JIANGSU	32.0	-113.5	44	44	1	50	
43	13	JIANGSU	32.0	-113.5	44	44	1	50	
44	13	JIANGSU	32.0	-113.5	44	44	1	50	
45	13	JIANGSU	32.0	-113.5	44	44	1	50	

APPENDIX B
DESCRIPTOR STRUCTURES

BRAZIL DATA YEAR ENTRY

There is a maximum of 32 years following the data descriptor entry for each region of Brazil; the data for two regions can be placed in each data block. Each year entry is 88 bytes long.

```
DCL 1 BRAZIL,
  2 YEAR          FIXED BIN(15,0),
  2 NXTYRREC      FIXED BIN(15,0),
  2 NXTYRDISP     FIXED BIN(15,0),
  2 FILLER        FIXED BIN(15,0),
  2 MEANTEMP(12)   FIXED BIN(15,0),
  2 PRECIP(12)     FIXED BIN(15,0),
  2 HARVESTED(4)   FIXED BIN(31,0),
  2 PRODUCTION(4)  FIXED BIN(21,0);
```

CHINA PROVINCE DATA YEAR ENTRY

There is a maximum of 32 years following the data descriptor entry for each province of China; the data for two provinces can be placed in each data block. Each year entry is 88 bytes long.

```
DCL 1 CHINA PROV,
  2 YEAR          FIXED BIN(15,0),
  2 NXTYRREC      FIXED BIN(15,0),
  2 NXTYRDISP     FIXED BIN(15,0),
  2 FILLER        FIXED BIN(15,0),
  2 MEANTEMP(12)   FIXED BIN(15,0),
  2 PRECIP(12)     FIXED BIN(15,0),
  2 HARVESTED(4)   FIXED BIN(31,0),
  2 PRODUCTION(4)  FIXED BIN(31,0);
```


CHINA WMO-STATION DATA YEAR ENTRY

There is a maximum of 40 years following the data descriptor entry for the Chinese WMO stations; the data for two stations can be placed in each data block. Each year entry is 56 bytes long.

```
DCL 1 CHINA_WMO,  
  2 YEAR          FIXED BIN(15,0),  
  2 NXTYRREC      FIXED BIN(15,0),  
  2 NXTYRDISP     FIXED BIN(15,0),  
  2 FILLER        FIXED BIN(15,0),  
  2 MEANTEMP(12)  FIXED BIN(15,0),  
  2 PRECIP(12)    FIXED BIN(15,0);
```

APPENDIX C
VARIABLE CODES

Meteorological Variables

Precipitation	5
Mean temperature	35

Yield Variables

Harvested	101
Production	103

Crops

Spring wheat	201
Winter wheat	202

Unit of measurement

Millimeters	201
Quintals	228
Hectares	236
Degrees Centigrade	241

Others

Monthly	26
Year	61
Pointer	90
Record pointer	91
Displacement pointer	92
Filler	99

APPENDIX D
CONVERSION PROGRAM LISTING
AND FLOWCHART

D-1
17

```

BRAZIL: PROC OPTIONS(MAIN);
  DCL AREA FLOAT HIN(21);
  DCL PROD FLOAT HIN(21);
  DCL IO FIXED(10,0) INIT(0101050000);
  DCL HCODE FIXED(3) INIT(101);
  DCL PCODE FIXED(3) INIT(103);
  DCL TCODE FIXED(3) INIT(35);
  DCL PPTCD FIXED(3) INIT(5);
  DCL YEAR FIXED(4);
  DCL TEMP(12) FIXED BIN(15,0) INIT((12,0));
  DCL PPT(12) FIXED HIN(15,0) INIT((12,0));
  DO I = 1 TO 11;
    GET SKIP EDIT(YEAR, AREA, PROD)
      (X(4), F(2,0), X(4), F(10,2), X(8), F(10,0));
    YEAR = YEAR + 1900; PROD = PROD / 100;
    PUT EDIT(YEAR, HCODE, AREA, IO)
      (X(2), F(4,0), F(3,0), F(10,0), X(50), F(10,0));
    PUT EDIT(YEAR, PCODE, PROD, IO)
      (X(2), F(4,0), F(3,0), F(10,0), X(50), F(10,0));
  END;
  DO J = 1 TO 11;
    GET SKIP EDIT(YEAR, TEMP(1), PPT(1) DO I=1 TO 12))
      (X(8), F(2,0), X(2), 12(F(2,0), F(3,0)));
    YEAR = YEAR + 1900;
    DO I = 1 TO 12;
      TEMP(I) = TEMP(I) * 10;
    END;
    PUT EDIT(YEAR, TCODE, TEMP(1) DO I=1 TO 12, IO)
      (X(2), F(4,0), F(3,0), 12 F(5,0), F(10,0));
    PUT EDIT(YEAR, PPTCD, PPT(1) DO I=1 TO 12, IO)
      (X(2), F(4,0), F(3,0), 12 F(5,0), F(10,0));
  END;
END BRAZIL;

```

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